Introduction

Purpose and Scope of this Report:

This report is a data points update of the initial Status and Condition Report prepared by the Seattle Department of Transportation (SDOT) through its Asset Management Program.

The report provides a description of the transportation infrastructure assets owned by SDOT: their value and condition; and the funding needed to maintain and preserve them. The data included is, in most cases, as of December 2009, except where noted. This updated Status and Condition Report focuses on the physical infrastructure assets in the transportation right-of-way (ROW) that are owned and operated by SDOT and that directly affect the delivery of transportation services to the public. It does not include real property owned by SDOT or maintenance facilities used to support maintenance activities.

SDOT also has jurisdiction over physical assets in the ROW that are owned by other parties. These assets, termed Regulated Assets, are not included in this report and will be addressed in subsequent documents.

Intended Use of this Document:

This report is intended for use by SDOT staff and serves multiple purposes:

- ✓ It provides a base of technical information about SDOT assets that will serve as a useful reference for department staff when making decisions.
- ✓ Asset funding requirements information will be available for budgeting and capital funding decisions. In subsequent years, as the Asset Management Program matures, the preservation needs of SDOT assets and the related funding requirements will become better understood and will better inform future year Budgets and TCIP development.
- ✓ This document also serves as a gap analysis, helpful in identifying steps SDOT will need to take to increase its competency in asset management.
- ✓ This document also briefly discusses the primary system automation tool SDOT employs in its asset and work management efforts. This system, the Infor Hansen software, is an enterprise database that serves as the asset data repository, and is integrated with GIS to allow for spatial reporting and analysis.

Organization of this Document:

The preceding Executive Summary provides a high-level summarization of SDOT assets: the condition and value of the assets; and the funding required to maintain and preserve them.

This introductory section provides an overview of the Department, the transportation environment and SDOT's asset management program, and the Hansen system.

The main section of this report provides more detailed information about each of the assets and is organized by asset class.

The detailed information about each asset, where available, includes:

- ✓ Current inventory and anticipated annual growth
- ✓ Condition ratings
- ✓ Useful life and estimated life cycle costs
- ✓ Maintenance approach
- ✓ Published performance measures
- ✓ Funding requirements
- ✓ Unmet funding needs

The appendices provide additional information, a glossary of terms used in this document, and more detailed supporting data.

How this Document was Prepared:

This document was prepared from data provided by SDOT asset owners. For this update, the department had the results of recent field inventories on many of the assets covered in the report.

Relationship to Other Planning Documents:

This report is a snapshot of the state of SDOT transportation infrastructure. Over time, this report will be refreshed to depict historical trends in the state, value, and condition of SDOT assets. It is a companion document to other SDOT guiding, planning and reporting documents, including:

Portion of the Sidewalk System

✓ SDOT Transportation Strategic Plan (TSP) – The 20-year plan, describing the actions SDOT will take to accomplish the goals and policies in the city of Seattle's Comprehensive Plan and the Puget Sound Regional Council's Destination 2030 plans, and in support of Mayor Nickels' four (4) priorities for Seattle.

✓ 6-Year Transportation Capital Improvement Program (TCIP) – A six-year plan for improvement and preservation projects for SDOT assets.

✓ SDOT Biennial Budget – A two-year projection of the revenues and resources required to support SDOT annual operations and maintenance activities, including the planning and administration of the SDOT organization.

Future Expectations for this Report:

As the Asset Management Program matures, SDOT will develop Asset Management Plans for each asset or asset class. These plans will contain detailed asset management strategies that will be the source of information used in subsequent Status and Condition Reports. The Asset Management Plans will advance TSP goals with specific actionable projects associated with each asset.

Overcoming Challenges:

The Asset Management initiative provides a long-term vision of how SDOT intends to accomplish its mission. Since SDOT is at the very beginning of this journey, areas that SDOT will continue to work on to perfect its asset management include:

- ✓ Establishing a common vocabulary. Criteria have been established for clearly determining at what level an asset will be managed, counted, valued, and funded.
- ✓ Establishing common asset standards. The maturity of asset management practices differ widely across SDOT divisions. As a result of developing this report, SDOT has launched an effort to set common standards for all asset management. Divisions are working to adjust practices and implement standards.
- ✓ Maintaining accurate repositories of asset inventories. Inventories are managed independently by each division through a wide variety of systems and practices. The level of information varies significantly. This report makes more definitive statements where information levels are high about maintenance needs and funding requirements.
- ✓ Establishing clear ownership for assets. Many assets are owned by other city departments, such as pedestrian lighting which is installed and maintained by Seattle City Light. Occasionally assets are created through a new capital project where ownership was not clearly established so SDOT division responsibility is not always obvious. As the Asset Management Program matures, ownership is being defined.
- ✓ Establishing clear responsibility for maintenance. While maintenance responsibility for most SDOT-owned assets is clear, maintenance responsibilities can be ambiguous for assets that cross organizational lines between the developer and the maintainer. As the Asset Management Program matures, maintenance responsibility is being defined.
- ✓ Managing Donated Assets. An improved process for managing new assets installed as part of private development and turned over to SDOT is being developed.
- ✓ Managing Regulated Assets. Although SDOT does not own all of the assets in the ROW, the Department has jurisdiction and legal responsibility. A different management approach is required for these assets.
- ✓ Establishing meaningful performance measures. The Asset Management Program will provide a method to establish clear, goal-oriented performance measures by establishing a Level of Service standard for each asset.
- ✓ Dealing with Strategic Assets. As the Asset Management Program matures, SDOT will have the tools to manage its assets at a more strategic level, such as considering travel corridors and neighborhoods, rather than on an asset-by-asset basis. Already this is starting as SDOT

Some of the many Regulated Assets in the Street ROW

incorporates strategic considerations into its planning using the directives of the "Complete Streets" Ordinance.

- ✓ Determining installation and maintenance costs per asset. SDOT management and financial systems do not always track costs at the asset levels developed in this report. To determine life cycle costs, information systems require a standard Asset Identifier in order to track acquisition costs and maintenance activity and costs. This requires a long-term information systems initiative. The Asset Management Program is working to establish requirements for this data as an ongoing activity.

Transportation System Environment

Transportation System Overview:

The city of Seattle covers 142.5 square miles - 83.87 square miles consisting of land and 58.67 square miles of water. The Seattle Metropolitan Area covers 8,186 square miles. There are approximately 3,946 12-foot wide lane miles of streets within the city of Seattle. The street ROW occupies 24.8% of the city surface area.

Seattle's urban transportation system consists of a street system with paved roads, a sidewalk system, a bicycle network, bridges and other roadway structures, a traffic control network, paths and trails, street signs, traffic safety structures and devices, and an urban forest. All of these infrastructure assets exist within the public ROW.

Value of the Transportation System:

The estimated replacement value of the transportation infrastructure assets is currently estimated at more than $12.1 billion.

Total Dollars Invested in Transportation Assets:

The city has invested in transportation infrastructure since its founding in 1851. The records of the cost of building these infrastructure assets existed in old paper ledgers that are no longer available, or, if they are, the cost figures are expressed in real dollars as of the date the monies were originally expended and would be meaningless in today's context.

Since 1980, an explicit record of the cost to build and perform major rehabilitation on infrastructure assets has been maintained and has been recently used for Governmental Accounting Standards Board, Statement 34, (GASB-34) reporting (see Appendix D). While this is only a partial representation of the total dollars invested in SDOT assets, it demonstrates that the Department has made an investment of $979 million in transportation infrastructure since 1980.

Seattle Growth and Development:

In 2000, Seattle had a population of 563,374 with a density of 6,901 people per square mile. Puget Sound Regional Council planners expect this population to grow by 200,000 by 2040.

Employment growth is expected to increase by 19% over 2002 levels to a total of 569,000 jobs by 2020. More than 75% of all trips within the city of Seattle are not work-related, but are taken for shopping, errands, and entertainment.

Traffic on the Alaskan Way Viaduct

This growth will significantly increase demand and stress on the city's transportation infrastructure.

The city will strive to accommodate growth through greater population densities and more transportation choices. The anticipated growth will impact the maintenance and operation of infrastructure assets and may require accelerated maintenance, replacement, and construction of new assets, and/or implementation of non-asset solutions.

Seattle Department of Transportation:

SDOT manages short- and long-term investments in streets, bridges, pavement, and trees to better connect the city with the region.

SDOT's annual budget was $341 million in 2009 $310 million in 2010. The Bridging the Gap (BTG) initiative supplied approximately 19% of the funding in 2009 and 20% of the funding for 2010. Approximately 14% to 15% % of the total budgets in 2009 and 2010 is provided by the city of Seattle's General Fund and Cumulative Reserve Fund. Another 4% is supported by a traditional transportation revenue source: the gasoline tax. These revenue sources are programmed to support the department's general maintenance and operations budget, as well as to provide partial support of the Transportation Capital Improvement Program (TCIP). In the 2010 budget of $310m, approximately 36%, or $112.6 million, is devoted to maintenance and operation of the existing transportation infrastructure. This represents approximately .9% of the replacement value of the infrastructure.

The traditional responsibility of SDOT has been to build, operate and maintain the transportation system. In more recent years the Department's mission and vision have been revised to include mobility, environmental stewardship, and economic vitality. The Asset Management Program will allow SDOT to operate and maintain infrastructure more strategically than ever before.

Landscaped Trail in an Industrial Area

SDOT Asset Management Program:

SDOT has adopted Asset Management to enable it to meet the challenges of preserving Seattle's transportation infrastructure. SDOT has elected to implement the asset management business model through a multi-year program of continuous, compounded improvement in infrastructure asset management policies and practices. More information about SDOT Asset Management principles is available in Appendix A.

SDOT's program approach is developing the building blocks for a basic Asset Management program. The Department has compiled asset inventory data (status and condition); has begun to develop level of service standards and performance measures for assets; is undertaking risk methodology development in 2010, and will begin standardization on life cycle cost analysis in 2010 and 2011. Working on this base of knowledge about assets/asset classes management plans will be assembled. Concurrently, the organization is building capacity in its Hansen enterprise data management system, in terms of a "build-out" of the system's capacities, and in terms of the Department's ability to take advantage of the data.

Hansen Enterprise Data Management System

SDOT initiated a project in 2000 to implement an integrated system to manage enterprise business data in a single, consolidated system. Hansen software was selected as the platform to manage asset data, work orders, materials inventory, permits, customer request and collision data. The department is now using the Hansen version 8 software for asset data and work management. . Spatial information about the location of each asset is maintained in ESRI ArcGIS and is available for viewing and analysis in Hansen's MapDrawer viewer and ESRI products. Hansen's GeoAdministrator tool is used to keep the Hansen and GIS data synchronized. Reports are available through Business Objects (SAP) Crystal Reports. The database platform is in Oracle 10g.

Asset data maintenance

Asset data stewards are responsible for the completeness and quality of their asset data. SDOT's Asset Management Program has established standards for the kinds of asset data that is maintained to ensure that information is consistent across all assets. Standard data includes asset status, condition information, ownership, maintenance responsibility, and location information. In addition to standard data, special information needed for each specific asset is maintained in the system; this includes, for example, materials, color, warranty information, or maintenance funding source.

As of December 2009, the following asset inventories are maintained in Hansen:

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Areaway Street Walls*	Pay Stations
Bicycle Racks	Radar Speed Signs
Bridges*	Retaining Walls*
Crash Cushions	Sidewalks
Guardrails	Sign Assemblies
Landscaped Complexes	Stairways*
Marked Crosswalks	Traffic Circles
Meters	Traffic Signals
Pavement*	Trees

The assets marked with an asterisk (*) have additional data maintained in other data systems.

Asset maintenance history

SDOT is implementing a work management system in Hansen 8 to standardize the way work is recorded and tracked across the department. This implementation will be rolled out in March and April 2010. Work orders are recorded against either a specific asset, or a type of asset, allowing costs to be analyzed at the asset level. As work orders are entered against assets, a picture of the lifecycle of each asset is created. The business procedures for closing work orders includes steps to ensure all relevant asset information is updated based on the work performed.

Using the historical information in the system, asset owners are able to create programs such as replacement programs or preventive maintenance programs. As data from the new work management accumulates in the system, SDOT will be able to establish asset-based funding needs for these programs.

Systems integration

Hansen software allows SDOT to integrate information on assets, work orders, permits, and collisions in a single data system. Users are able to view a block or intersection along with the assets along the block, permits, open or recent work orders, and collision history.

External system interfaces tie the system to Seattle's financial and human resources databases to minimize duplication of data entry. GIS systems are utilized to visually integrate and display information on a map, providing system users with a more complete picture of any location in the City. Analysis of

GIS map representations of assets is used n increasingly for long-term planning purposes as well as operational planning.

Future opportunities

As part of ongoing improvements to asset data management, SDOT is planning to begin using the Inspections module in Hansen in late 2010 – early 2011. Asset owners will record observations about their assets, and the system will calculate a condition rating based on these results. Tracking observed changes in condition over time will provide additional inputs into data-driven asset management program decisions.

Future plans for the system, not yet funded, include implementing an asset analytics module to assess risk and condition, assisting with more automated development of maintenance and rehabilitation programs. SDOT is also assessing the benefits of adding a mobile component to its systems, allowing access to work orders, permits, and asset inspection information from the field.

Customer request tracking may also be added in the future, allowing customer interactions to be tracked from initiation through investigation, assessment of impact on infrastructure, work performed, and notification back to the customer.

In summary

SDOT's Hansen system is a management tool that enables SDOT to retain a great deal of information in a central repository. It has enforced standardization in data management across the department and improves the quality of Transportation system service delivery.

Status and Condition of SDOT Infrastructure Assets

Overview:

The transportation infrastructure owned by SDOT is made up of hundreds of distinct physical components. SDOT has organized them into an Asset Hierarchy (see Appendix B) and has identified 44 different "level 1" assets that are the management basis. Asset ownership has been assigned for each level 1 asset. SDOT staff members who serve as asset owners are recognized as the primary sources of information and knowledge about capital investment needs, preservation, maintenance and operation of the asset.

Level 1 assets that share a common purpose or function have been grouped into asset classes. The Status and Condition of the level 1 assets is presented in alphabetical order by asset class.

A condition rating has been specified for each of the level 1 assets where known. This condition rating is a consistent measure used for all SDOT assets.

Asset Condition Ratings

Condition Rating	Definition
Good	Asset is "as new" or requires only routine maintenance to keep it in service
Fair	Asset requires major rehabilitation to keep it in service
Poor	Asset should be replaced

While this condition rating is consistently used for all SDOT assets, the criteria against which the asset is evaluated to derive the condition rating are different for each asset. Condition criteria are available in Appendix C.

The asset condition rating may also be noted as "to-be-determined" (TBD) if the condition of the asset is unknown. Assets are generally rated as TBD if the time period between periodic inspections is long, or the asset is managed on a customer-request basis and no requests have been received for the asset that necessitated an on-site inspection of the asset.

In the discussion of the useful life, statements about the cost of routine maintenance over the life of the asset are based on maintaining the asset in good condition.

The discussion of maintenance approaches will include references to safety repair or work that is done to address a safety concern. The term "safety" is used as a means of prioritizing maintenance work against limited funding and is not an assessment of defects that would result in an asset being judged as unsafe.

Assets that have received BTG funding are identified in the document by the BTG logo and have associated BTG performance measures.

Financial figures used in this document are generally expressed in2009 dollars unless otherwise noted. Where the time-value of dollars is important, a 3% inflation factor has been used, and these are noted.

The funding requirements discussed in this section are estimates based on available financial information about each asset. A rigorous reconciliation to budget and financial information was not conducted primarily because current financial systems, with few exceptions, do not track budgets or costs by asset.

Unmet funding needs discussed in this document are presented for informational purposes and are not intended as a recommendation.

Asset Classes:

What follows is a class-by-class discussion of the transportation infrastructure assets within each asset class:

- ✓ Bicycle and Pedestrian System
- ✓ Channelization
- ✓ Intelligent Traffic Signs
- ✓ Parking Payment Devices
- ✓ Pavement System
- ✓ Real Property
- ✓ Regulated Assets
- ✓ Roadway Structures
- ✓ Seattle Streetcars
- ✓ Signs
- ✓ Structures other than Roadway
- ✓ Traffic Safety Structures & Devices
- ✓ Traffic Signal System
- ✓ Urban Forest